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OF

THE WISTAR INSTITUTE

OF

ANATOMY AND BIOLOGY,

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ORGANIZATION AND WORK

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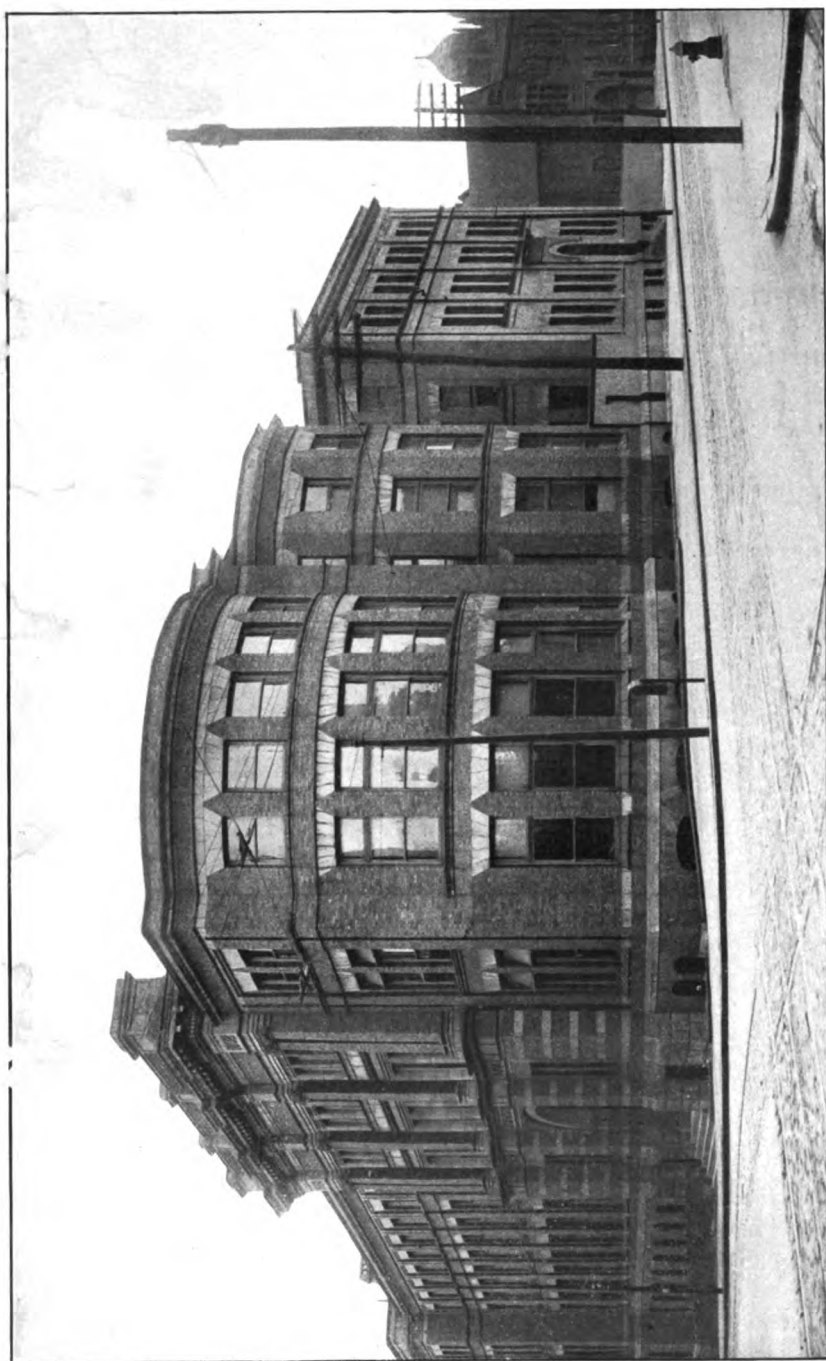
THE WISTAR INSTITUTE



NOVEMBER, 1916



**THE WISTAR INSTITUTE OF ANATOMY
AND BIOLOGY
ORGANIZATION AND PURPOSES**



Laboratory and Museum Building at Woodland Avenue and Thirty-sixth Street

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY

This Bulletin is for the information of those interested in the origin, management and objects of The Wistar Institute, and of those zoologists and anatomists who wish to know about the opportunities which the Institute offers for advanced study and research.

ORIGIN

The Wistar Institute owes its origin, like other research institutes, to the demand for well equipped institutions where special researches may be pursued without the interruptions incident to undergraduate teaching. It was the first research institute to be established in America.

In 1808 Dr. Caspar Wistar was chosen as Professor of Anatomy in the Medical School of the University of Pennsylvania. Dr. Wistar held this chair until his death in 1818. During this period he wrote the first American text book of anatomy (1811), and prepared for his use in teaching anatomy a large series of dissections which were later presented to the University of Pennsylvania by his widow, Elizabeth Mifflin Wistar.

PURPOSES OF THE INSTITUTE

This collection increased by Wistar's successor, Dr. Willⁱ E. Horner, and by subsequent incumbents of the chair of Anatomy was known as the Wistar or Wistar and Horner Museum.

For the safe preservation of this Museum and its extension to include materials and equipment for the more advanced study of anatomy and for the prosecution of researches in anatomy and other biological subjects, the present institution was incorporated in 1892 under charter from the Commonwealth of Pennsylvania, as The Wistar Institute of Anatomy and Biology.

The University of Pennsylvania presented to the new corporation the collection forming the Wistar Museum and also a plot of ground upon which a suitable building was erected in 1893.

The building and a liberal endowment were provided by General Isaac J. Wistar, thus perpetuating in its name the memory of his great-uncle Dr. Caspar Wistar, the Anatomist.

Under the terms of the trust creating this endowment the Museum of the Institute is open to teachers and students. The laboratories are for the exclusive use of graduate students and investigators.

The use of the Institute to replace, modify or interfere with such elementary instruction in biological subjects as is or may be given at the University of Pennsylvania or other schools and colleges, is prohibited.

Instruction given must be of the graduate type and in research on biological subjects.

Fellowships are provided for younger men who are beginning their careers as professional biologists.

Provision is made for the conduct of publications.

General Wistar's Deeds of Trust place the stamp of approval upon any biological work intended to extend the limits of human knowledge.

MANAGEMENT

By General Wistar's Deeds of Trust the control of the Wistar Institute is placed in the hands of a Board of nine Managers elected annually by the Trustees of the University of Pennsylvania. One Manager, so elected, must be a male descendent of General Wistar's father, while two Managers must be the President and Vice-President of the Academy of Natural Sciences of Philadelphia, or such other two of its members as the Academy may designate.

ORGANIZATION

DR. EDGAR F. SMITH, *President*
DR. MILTON J. GREENMAN, *Secretary*
MR. JONATHAN M. STEERE, *Treasurer*

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The work of the Institute is conducted by the following group of persons comprising

THE STAFF

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 HELEN DEAN KING, *Assistant Professor of Embryology*
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ADVISORY BOARD

In April, 1905, a number of leading American anatomists were invited to consider with the Managers of the Institute including the Donor, General Wistar, the lines of research that might be developed with most advantage to American biology, and how, under the limitations of its Trust Deeds, the Institute could render the greatest service to biological science.

This conference resulted in the organization of a permanent Advisory Board, constituted at the present time as follows:

LEWELLYS F. BARKER, *Professor of Clinical Medicine, Johns Hopkins University*
 EDWIN G. CONKLIN, *Professor of Zoology, Princeton University*
 HENRY H. DONALDSON, *Professor of Neurology, The Wistar Institute*
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 GEORGE A. PIERSOL, *Professor of Anatomy, University of Pennsylvania*

The Advisory Board meets in April of each year and acts in an advisory capacity upon the more important questions of the scientific policy of the Institute.

This Board has rendered invaluable service in coordinating the work of the Institute with that of other research laboratories of the country; in advising upon lines of work for which the Institute is especially well equipped; in bringing the Institute into relations with other scientific bodies, and in bringing together under one management some of the more important biological publications.

BUILDINGS AND EQUIPMENT

The Wistar Institute occupies a triangular plot of ground bounded by Thirty-sixth Street on the East, by Woodland Avenue on the Northwest and by Spruce Street on the Southwest. This plot adjoins the grounds of the University of Pennsylvania.

The original building, completed in 1893, is four stories high and extends along Thirty-sixth Street from Spruce Street to Woodland Avenue, a distance of 224 feet with an average width of 64 feet. To this building was added in 1897 a wing 46 feet wide, four stories high and extending along Woodland Avenue 64 feet. These buildings are fireproof structures.

About one-fourth of the floor space of the main building is occupied by the exhibition halls of the museum, while the remaining space is devoted to the laboratories, libraries, photographic rooms, the store rooms, shops, heating and lighting plants, and administration and publication offices. An apartment in the Woodland Avenue wing is reserved as a residence for the Director.

At the intersection of Woodland Avenue and Spruce Street is the Annex, a group of buildings three stories high whose total length is 188 feet with an average width of 35 feet. These buildings were built and used originally by the City of Philadelphia as a Police Station. They were reconstructed in 1914 and 1915, for purposes of the Institute and are regarded as temporary, eventually to give place to more modern fireproof structures.

The Annex furnishes ample quarters for the animal colony. It also contains four small laboratories, a seminar room, a room for photography, a lunch room for employees, an apartment for a resident Fellow, and an engineer's flat.

The equipment in the main building consists of a heating, lighting and power plant for general purposes of the Institute; a one-half ton refrigerating machine with refrigerator, for laboratory purposes, and two machine shops fully equipped with machine and bench tools for the construction of metal museum cases and special apparatus and equipment not to be found in the markets.

A glass grinding and polishing outfit, and other machine tools for preparing museum exhibits and for general purposes are provided. A printing equipment for the smaller work of the Institute is maintained.

Provision is made for hatching fresh water forms and rearing larvae for experimental work.

Four large general laboratories and fourteen smaller ones, including four in the Annex, equipped with suitable laboratory apparatus and the best of optical instruments, furnish facilities for the research of the Institute's staff and space for a number of advanced students and guests.

The chief purpose of the Annex is to furnish space for the animal colony. Here more than 1000 sanitary cages are provided for the breeding and rearing of a homogeneous strain of albino rats, used for research purposes in the laboratories and for numerous breeding experiments.

ACTIVITIES

Museum

The Institute maintains a museum of human and comparative anatomy intended especially for teachers and students, but open without charge to the general public. The museum specimens are arranged in two groups (a) those for public demonstration, in educational exhibits, and (b) those held for research purposes.

Materials and specimens are available for the use of properly accredited students. Since the organization of the Institute the number of catalogued specimens has increased five fold and includes much material of research value.

Here may be mentioned the anthropological material consisting of a large collection of prehistoric North and South American Indian skulls of different ages, modern Esquimau skulls of different ages, modern Chinese skeletons,—for race types; a large collection of human brains, representing the negro, the Filipino and high type Americans.

The embryological collection is valuable for its series of timed embryos presenting the development of the rat. The development of this type is shown in numerous original Born models which have been made in connection with researches in this subject.

A large number of microscopic neurological preparations, representing researches completed and in progress are to be found in the Museum.

It is the present plan to have the growth of the Museum represent the activities of the laboratories and to serve also as a repository for material which has been used for important researches elsewhere. The development of the Museum thus follows the line of the Institute's researches.

The results of these researches are presented by preparations, charts, drawings, photographs, models and other data in a manner to illustrate the purpose of the work and aid in further investigation.

By the more modern arrangement of its preparations, charts and models, the Museum is intended to instruct the public in regard to the manner in which research is conducted.

Research

The research of the Institute is chiefly in the fields of neurology, embryology and genetics, although it is not limited to these fields.

The neurological work at present is concerned with the problem of the growth of the nervous system. In connection with

the neurological work many allied problems have been attacked, including the growth of the entire body, and the more important thoracic and abdominal viscera, ductless glands, etc., with the purpose of determining how far the growth of the nervous system might be correlated with that of these other organs. The chemistry of nerve tissue is receiving attention.

Probably no other part of the mammalian organism offers so many problems calling for solution as the nervous system. Ample opportunity is offered in the Institute laboratories for capable investigators to extend the knowledge of this system.

The embryological research is at present concerned with the study of the developing organs in the mammal with special attention to the embryology of the rat. This animal is especially favorable for study because of the abundance of timed material which is always available in the colony.

Problems dependent upon vital staining—staining living tissues by feeding or injecting dyes—have occupied the attention of several guests in the Institute's laboratories. The colony furnishes abundant material for such work.

The work in genetics includes a number of problems among which may be mentioned: Effects of selection and inbreeding on sex ratio, growth, fertility and vigor; the effect of age of mother on the growth and vitality of her young; transmission of physical defects; inheritance of body size and fertility; Mendelian inheritance in different strains of rats. The wild gray, the dilute gray, the albino, the hooded, and the yellow rat are being used for this work. All these problems are receiving attention.

Much of the research work in genetics has a direct application in every day life, as for instance the recently acquired knowledge that the proportion of either females or males in a strain of animals may be increased or diminished by suitable selection.

The Institute has on file the original data and complete records, bearing upon the problem of growth, from a number of investigators and laboratories. These records together with the records of all research done at the Institute are available to investigators for verification or other use.

Arrangements may be made by which candidates for the Doctor's degree, in the University of Pennsylvania, may pursue their major in Neurology at the Institute.

Qualified men are always welcome guests in the Institute's laboratories which are open throughout the entire year except during August.

The rat colony

For very good reasons the albino rat is the animal used for a large portion of the researches of the Institute. Structures and processes found in one mammal may for the most part be expected in another, hence the results of observations on the rat may be applied to man with much success, especially if the animals are compared at equivalent ages.

The rat is of convenient size to handle and inexpensive to maintain. The albino rat is a sport from the gray Norway—our common rat. Both forms are cosmopolitan—the Norway being the wild parent species and the albino representing the domesticated variety. Though there are distinct structural differences, besides color, distinguishing these two forms, yet so far as they have been tested, the Norways are like Norways and the Albinos like Albinos wherever found. It is, therefore, possible for laboratories widely separated to use similar animals.

The span of life is short—about three years. The females begin to reproduce when about three months of age. Gestation requires 21–22 days, and from four to ten litters are born during the life time of a female, each litter containing from six to eight young. The young are very immature at birth and dependent on the mother for about three weeks.

Its rapid breeding habits and the large number of young in a litter make it a suitable animal for study of the problems of heredity, breeding and embryology. Its immaturity at birth is of value since it permits of the modification of various parts by treatment at a very early age. Thus in the case of the cerebellum—where cell division is active for seven days or more after birth—the influence of nutritional or other conditions on cell



Interior of Animal House

multiplication in the central system may be studied. The omnivorous habit of the rat is of importance in nutritional work since it permits of a comparison of the effects of a strictly animal diet with those of a strictly vegetable diet.

The rat also responds to training which makes it peculiarly suitable for studies on behavior, in which brain characters may be correlated with the ability to learn and remember.

In experimental work with this animal the litter is regarded as the unit and results are most accurately measured by using part of a litter for experiment and the remainder for control.

With an equipment of more than one thousand sanitary cages between three and four thousand albino rats are continually maintained in the colony. Animals of any age or weight—and in litters with their mothers—are always available. An abundance of timed embryological material is constantly on hand. There are ample opportunities for the study of developing tissues by vital staining methods.

The colony is maintained with the greatest care as to the health of animals and every effort is made to keep on hand a standard strain for experimental purposes.

Animal experimentation involving operations upon living animals is regulated by the Board of Managers.

The facilities of the colony have been extended from time to time in order to supply animals to other investigators who have found it desirable to use this type.

PUBLICATIONS

The Wistar Institute publishes

The Bulletin of the Wistar Institute

Journal of Morphology

The Journal of Comparative Neurology

The American Journal of Anatomy

The Anatomical Record

The Journal of Experimental Zoology

Memoirs of the Wistar Institute.

The Bulletin of The Wistar Institute appearing at irregular intervals is intended to meet the administrative needs of the Institute, such as special announcements and short articles relating to the general activities of the Institute, and for the publication of material from the Institute or other laboratories which may not be suitable for the journals.

The publication of the five journals is a cooperative work undertaken by the Institute to aid American biological science. While these publications have extensive subscription lists the income thus derived is insufficient for their support.

The Wistar Institute acts as publisher and assumes the financial responsibility, but the journals are edited by representative zoologists and anatomists located in other institutions throughout the country.

Papers in French, German, Spanish and Italian, as well as English, will be received for publication in these languages.

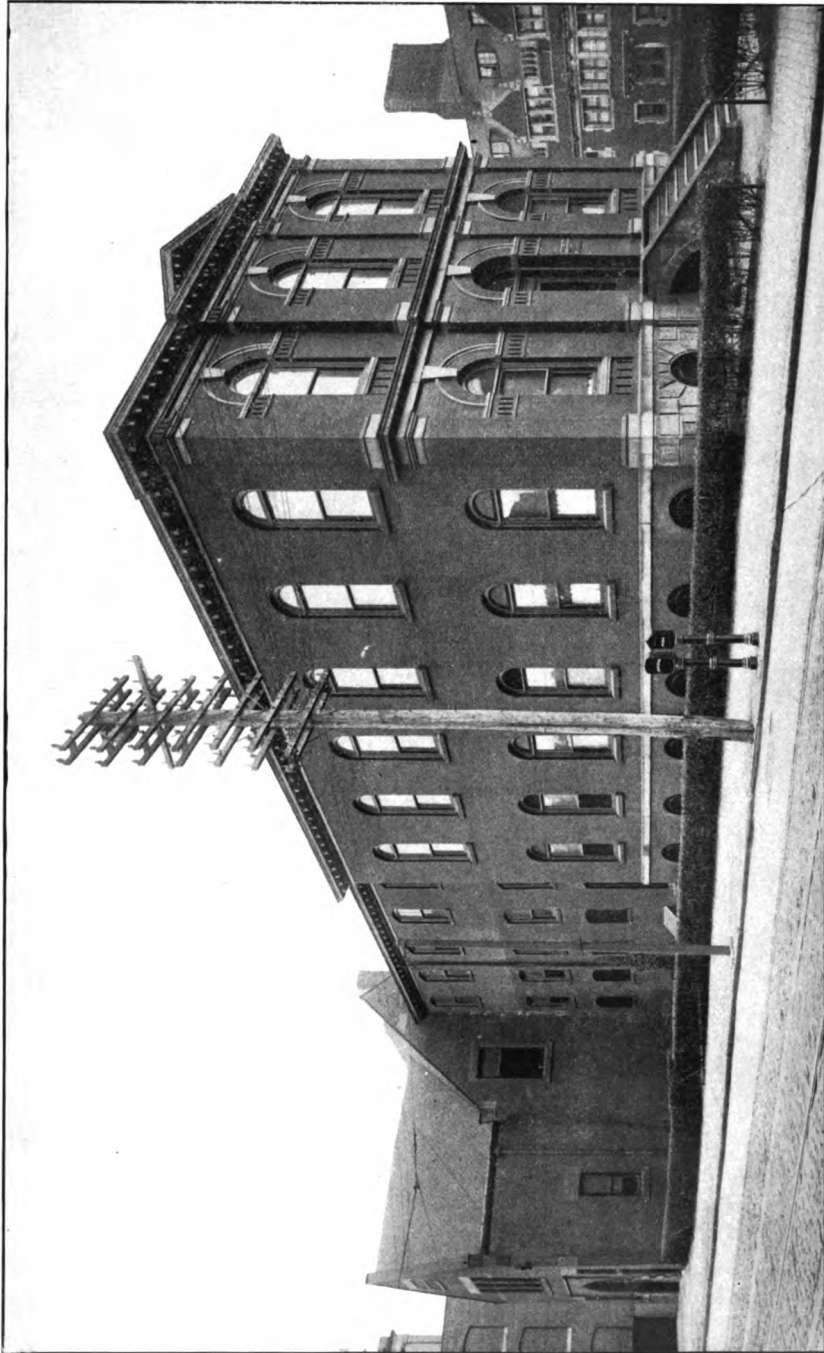
These journals are distributed to members of the American Association of Anatomists and to members of the American Society of Zoologists.

Papers published in any one of these journals receive a more extensive distribution than would be accorded by any other similar journal now published.

The Memoirs of The Wistar Institute are intended for the publication of monographs too long to be included in the journals. They have as a rule been financed by the laboratory from which they came and special arrangements are required for publication in this series.

Information regarding the activities of the Institute, the opportunities or facilities offered investigators, or the publication of papers may be had by addressing

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